

WHAT IS CLAIMED IS:

- 1 1. A device for emitting composite output light, said device comprising:
 - 2 a light source that emits original light, the light source including a
 - 3 fluorescent layer having a property to convert some of said original light into first
 - 4 converted light; and
 - 5 a wavelength-conversion region optically coupled to said light
 - 6 source to receive some of said original light and said first converted light, said
 - 7 wavelength-conversion region including a fluorescent material having a property
 - 8 to convert some of said original light into second converted light, said original
 - 9 light, said first light and said second converted light being components of said
 - 10 composite output light.
- 1 2. The device of claim 1 wherein said light source is a light emitting diode
- 2 die and wherein said fluorescent layer is a substrate of said light emitting diode
- 3 die.
- 1 3. The device of claim 1 wherein said fluorescent material of said
- 2 wavelength-conversion region includes at least one of fluorescent organic dye,
- 3 inorganic phosphor and nano-phosphor.
- 1 4. The device of claim 1 wherein said fluorescent material of said
- 2 wavelength-conversion region includes fluorescent particulates to scatter said
- 3 original light and said first converted light that propagate through said
- 4 wavelength-conversion region.
- 1 5. The device of claim 1 wherein said wavelength-conversion region is
- 2 configured to substantially enclose said light source over a surface on which said
- 3 light source is positioned.
- 1 6. The device of claim 5 wherein said wavelength-conversion region is
- 2 positioned on said light source such that said light source is covered by said
- 3 wavelength-conversion region.

1 7. The device of claim 1 wherein said wavelength-conversion region is
2 configured as a planar layer positioned over said light source.

1 8. A method for emitting composite output light, said method comprising:
2 generating original light within a light source;
3 converting some of said original light into first converted light
4 within said light source;
5 converting some of said original light into second converted light
6 outside of said light source; and
7 emitting said original light, said first converted light and said
8 second converted light as components of said composite output light.

1 9. The method of claim 8 wherein said generating of said original light
2 includes generating said original light within an active layer of a light emitting
3 diode die.

1 10. The method of claim 9 wherein said converting of said original light into
2 said first converted light includes converting said original light into said first
3 converted light at a fluorescent substrate of said light emitting diode die.

1 11. The method of claim 8 wherein said converting of said original light into
2 said second converted light includes converting said original light into said second
3 converted light at a wavelength-conversion region optically coupled to said light
4 source.

1 12. The method of claim 11 wherein said converting of said original light into
2 said second converted light includes converting said original light into said second
3 converted light using fluorescence.

1 13. The method of claim 12 wherein said converting of said original light into
2 said second converted light includes scattering said original light and said first
3 converted light propagating through said wavelength-conversion region.

- 1 14. A device for emitting composite output light, said device comprising:
 - 2 a semiconductor die that emits first light of a first peak wavelength,
 - 3 said semiconductor die including a fluorescent substrate having a property to
 - 4 convert some of the first light into second light of a second peak wavelength; and
 - 5 a wavelength-conversion region positioned to receive at least some
 - 6 of said first light and said second light, said wavelength-conversion region having
 - 7 a property to convert some of said first light into third light of a third peak
 - 8 wavelength, said first light, said second light and said third light being
 - 9 components of said composite output light.
- 1 15. The device of claim 14 wherein said semiconductor die is a light emitting
- 2 diode die.
- 1 16. The device of claim 14 wherein said wavelength-conversion region
- 2 includes at least one of fluorescent organic dye, inorganic phosphor and nano-
- 3 phosphor.
- 1 17. The device of claim 14 wherein said wavelength-conversion region
- 2 includes fluorescent particulates to scatter said first light and said second light that
- 3 propagate through said wavelength-conversion region.
- 1 18. The device of claim 14 wherein said wavelength-conversion region is
- 2 configured to substantially enclose said semiconductor die over a surface on
- 3 which said semiconductor die is positioned.
- 1 19. The device of claim 18 wherein said wavelength-conversion region is
- 2 positioned on said semiconductor die such that said semiconductor die is covered
- 3 by said wavelength-conversion region.
- 1 20. The device of claim 14 wherein said wavelength-conversion region is
- 2 configured as a planar layer positioned over said semiconductor die.